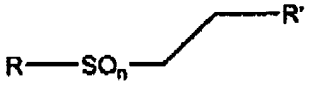
Application No.: 09/743,746
Attorney Docket No.: 068800-0276611

Amendments to the Claims

This listing of claims replaces all prior versions and listings of the claims in this application.

1. (Currently amended) A method for identifying an analyte, comprising the steps of:

(a) providing a compound in which the analyte is attached by a cleavable linker to a reporter group relatable to the analyte, the compound having the following formula:



wherein either R comprises the reporter group and R' comprises the analyte, or R comprises the analyte and R' comprises the reporter group; wherein R' is selected from the group consisting of [[–S-,]] -SO-, -NR^1, and –O- between the C atom that is in the ß-position to the SO_n group and the reporter group or analyte, R^1 is a hydrogen atom, a halogen atom, or a substituent containing a carbonyl group, a halogen atom, or both, and n is 1 or 2; and wherein the analyte comprises a biological molecule comprising a nucleophile selected from the group consisting of amines, thiols, and hydroxyls;

(b) cleaving the reporter group from the analyte, wherein the cleavage takes place between the R' group and the carbon atom in the beta position with respect to the sulphone or sulphoxide ~~by beta-elimination between the R' group and the adjacent carbon atom~~; and

(c) identifying the reporter group by mass spectrometry and determining the mass-to-charge ratio of the reporter, thereby identifying the analyte.

2. (Original) A method according to claim 1, wherein R and/or R' comprise a covalent linkage attaching the analyte and/or reporter group to the cleavable linker.

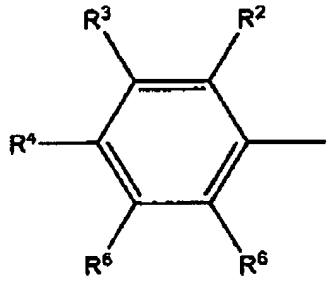
3. (Withdrawn) A method according to claim 2, wherein the covalent linkage is independently selected from a –CO-NH- group, an –NH-CO-NH- group, an –NH-CS-NH-

group, a $-CH_2-NH-$ group, a SO_2-NH- group, a $-NH-CH_2-CH_2-$ group, or an $-OP(=O)(O)O-$ group.

4. (Original) A method according to any preceding claim, wherein R comprises, between the SO_n group and the reporter group or analyte, a substituted or unsubstituted aromatic cyclic group, aliphatic cyclic group, or heterocyclic group.

5. (Previously presented) A method according to claim 4, wherein R comprises, between the SO_n group and the reporter group or analyte, a substituted or unsubstituted group selected from the group consisting of phenyl, pyridyl, pyranyl, napthyl, anthracyl, pyrenyl, and fused ring derivatives or heteroaromatic analogues of the above.

6. (Previously presented) A method according to claim 5, wherein the phenyl group is a group having the following formula:



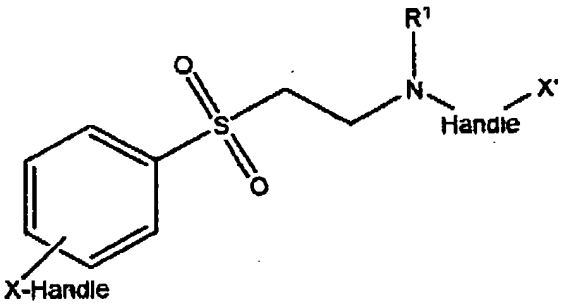
wherein one of R^2-R^6 comprises the reporter group or analyte, and the remaining R^2-R^6 groups are independently selected from the group consisting hydrogen, deuterium, flourine, methyl, a methoxy group, a hydroxy group and an amino group.

7-9. (Cancelled).

10. (Currently amended) A method according to claim 1, wherein R^1 is a fluorine atom, a chlorine atom, a bromine atom, an iodine atom, a trifluoroacetyl group, or a trifluoromethyl acetate group, and wherein R^1 optionally further comprises a mesyl group or a tosyl group.

Application No.: 09/743,746
Attorney Docket No.: 068800-0276611

11. (Currently amended) A method according to claim 1, wherein the compound has the following formula:



wherein R^1 is a hydrogen atom, a halogen atom or a substituent comprising a carbonyl group and/or a halogen atom, and wherein R^1 optionally further comprises a mesyl group, a tosyl group or a trifluoroacetyl group ~~an electron withdrawing substituent~~, X comprises the reporter group and X' comprises the analyte, or X comprises the analyte and X' comprises the reporter group, and each Handle is the same or different, being either a single bond directly attaching the X groups to the phenyl ring and the N atom respectively, or a reactive group capable of attaching the X groups to the phenyl ring and the N atom respectively.

12. (Cancelled).

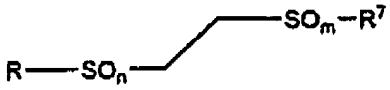
13. (Previously presented) A method according to claim 11 or claim 12, wherein each Handle is independently selected from a –CO-NH- group, an –NH-CO-NH- group, an –NH-CS-NH- group, a $-CH_2$-NH- group, a SO_2-NH- group, a –NH-CH_2-CH_2- group, or an –OP(=O)(O)O- group.

14. (Withdrawn) A method according to any preceding claim, wherein the analyte comprises a biological molecule.

15. (Withdrawn) A method according to claim 14, wherein the biological molecule is selected from a protein, a polypeptide, an amino acid, a nucleic acid, a nucleic acid base, a pharmaceutical agent or drug, a carbohydrate, a lipid, a natural product and a synthetic compound from an encoded chemical library.

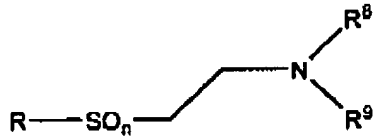
16. (Withdrawn) A compound according to claim 15, wherein the nucleotide, oligonucleotide or nucleic acid is natural, or is modified by modifying a base, sugar and/or backbone of the nucleotide, oligonucleotide or nucleic acid.

17. (Withdrawn) A method according to claim 15 or claim 16, wherein the analyte is an amino acid or a peptide comprising a cysteine group, and the compound is of the formula:



wherein m is 0 or 1 and the S atom attaching R^7 to the linker is the sulphur atom of the cysteine group, R^7 being the remainder of the amino acid or polypeptide.

18. (Withdrawn) A method according to claim 15 or claim 16, wherein the analyte is an amino acid or peptide, and the compound is of the formula:



wherein the N atom is the nitrogen atom of an epsilon amino group of a lysine group, or is the nitrogen atom of an N-terminal alpha amino group, R^8 is selected from H, O or an N-protective group, R^9 being the remainder of the amino acid or polypeptide.

19. (Withdrawn) A method according to claim 15 or 16, wherein the analyte is an amino acid or a peptide comprising a serine, threonine and/or tyrosine group, and the compound is of the formula:

wherein the O atom is the oxygen atom from a hydroxyl group of the serine, threonine or tyrosine group, R^{10} being the remainder of the amino acid or polypeptide.

20. (Previously presented) A method according to claim 1, wherein the reporter group

comprises a mass marker detectable by mass spectrometry.

21. (Original) A method according to claim 20, wherein the mass marker comprises an oligoether or a polyether.

22. (Original) A method according to claim 21, wherein the oligoether or polyether is a substituted or unsubstituted oligo- or poly-arylether.

23. (Withdrawn) A method according to claim 21 or claim 22, wherein the oligoether or polyether comprises one or more fluorine atom or methyl group substituents, or one or more ^{2}H or ^{13}C isotopic substituents.

24. (Withdrawn) A method according to any of claims 20-23, wherein the mass marker comprises a metal ion-binding moiety.

25. (Withdrawn) A method according to claim 24, wherein the metal ion-binding moiety is a porphyrin, a crown ether, hexahistidine, or a multidentate ligand.

26. (Withdrawn) A method according to claim 25, wherein the metal ion-binding moiety is a bidentate ligand or is EDTA.

27. (Withdrawn) A method according to any of claims 24-26, wherein the metal ion-binding moiety is bound to a monovalent, divalent, or trivalent metal ion.

28. (Withdrawn) A method according to claim 27, wherein the metal ion is a transition metal ion, or a metal ion of group Ia, IIA or IIIA of the periodic table.

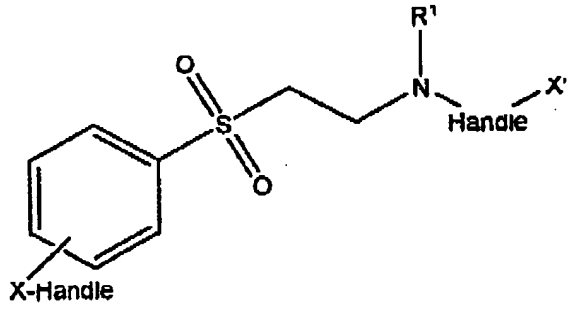
29. (Withdrawn) A method according to claim 28, wherein the metal ion is Ni^{2+}, Li^{+}, Na^{+}, K^{+}, Mg^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, or Al^{3+}.

30. (Withdrawn) A method according to any preceding claim, which method further comprises heating the linker to cleave off the reporter group.

31. (Previously presented) A method according to claim 1, wherein the reporter group is a mass marker and the method further comprises cleaving off the mass marker in the mass spectrometer.

32-34. (Cancelled).

35. (Withdrawn) A compound having the following formula:



wherein R^1 is an electron withdrawing substituent, X comprises the reporter group and X' comprises the analyte, or X comprises the analyte and X' comprises the reporter group, and each Handle is the same or different, being either single bond directly attaching the X groups to the phenyl ring and the N atom respectively, or a reactive group capable of attaching the X groups to the phenyl ring and the N atom respectively.

36. (Withdrawn) A compound according to claim 35, wherein R^1 is selected from a hydrogen atom, a halogen atom, or a substituent comprising a carbonyl group and/or halogen atom.

37. (Withdrawn) A compound according to claim 35 or claim 36, wherein each Handle is independently selected from a –CO-NH- group, an –NH-CO-NH- group, an –NH-CS-NH- group, a $-CH_2$-NH- group, a SO_2-NH- group, a –NH-CH_2-CH_2- group, or an –OP(=O)(O)O- group.

38. (Withdrawn) A compound according to any of claims 35-37, wherein the analyte is as defined in any of claims 14-19.

39. (Withdrawn) A compound according to any of claims 35-38, wherein the reporter is as defined in any of claims 20-29.